

FORM PTO-1390
(REV. 12-2001)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

2031JB.35546

U.S. APPLICATION NO. (If known, see 37 CFR 1.5

Unpublished
10/069335

INTERNATIONAL APPLICATION NO.

PCT/US00/40731

INTERNATIONAL FILING DATE

24 AUGUST 2000

PRIORITY DATE CLAIMED

24 AUGUST 1999

TITLE OF INVENTION

AUTOMOBILE REGISTRATION AND INSPECTION SYSTEM

APPLICANT(S) FOR DO/EO/US

JOHN D. KONDRICK, JR., JIM DON SMITH, and DONALD J. BERGERON

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☒ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information: return postcard, formal drawings

U.S. APPLICATION NO. (if known, see 37 CFR 1.53) 10/069335 INTERNATIONAL APPLICATION NO. PCT/US00/40731	ATTORNEY'S DOCKET NUMBER 2031JB.35546
---	--

21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =	CALCULATIONS PTO USE ONLY																									
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	\$ 710.00																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">CLAIMS</th> <th style="width: 20%;">NUMBER FILED</th> <th style="width: 20%;">NUMBER EXTRA</th> <th style="width: 20%;">RATE</th> <th style="width: 20%;">\$</th> </tr> <tr> <td>Total claims</td> <td>13 - 20 =</td> <td>0</td> <td>x \$18.00</td> <td>\$</td> </tr> <tr> <td>Independent claims</td> <td>2 - 3 =</td> <td>0</td> <td>x \$84.00</td> <td>\$</td> </tr> <tr> <td colspan="4">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ \$280.00</td> </tr> <tr> <td colspan="4">TOTAL OF ABOVE CALCULATIONS =</td> <td>\$ 710.00</td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	Total claims	13 - 20 =	0	x \$18.00	\$	Independent claims	2 - 3 =	0	x \$84.00	\$	MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$280.00	TOTAL OF ABOVE CALCULATIONS =				\$ 710.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$																						
Total claims	13 - 20 =	0	x \$18.00	\$																						
Independent claims	2 - 3 =	0	x \$84.00	\$																						
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$280.00																						
TOTAL OF ABOVE CALCULATIONS =				\$ 710.00																						
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.	+																									
SUBTOTAL =	\$ 355.00																									
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	\$																									
TOTAL NATIONAL FEE =	\$																									
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +	\$ 40.00																									
TOTAL FEES ENCLOSED =	\$ 395.00																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Amount to be refunded:</td> <td style="width: 20%;">\$</td> </tr> <tr> <td>charged:</td> <td>\$</td> </tr> </table>	Amount to be refunded:	\$	charged:	\$																					
Amount to be refunded:	\$																									
charged:	\$																									

a. ☒ A check in the amount of \$ 395.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
 A duplicate copy of this sheet is enclosed.

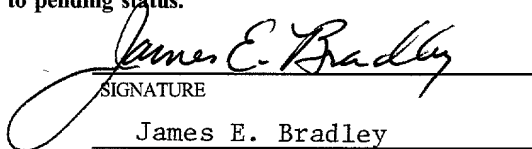
c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
 overpayment to Deposit Account No. 50-0259. A duplicate copy of this sheet is enclosed.
 (2031JB.35546)

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card
 information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

James E. Bradley
 Bracewell & Patterson, L.L.P.
 P.O. Box 61389
 Houston, Texas 77208-1389


 SIGNATURE
 James E. Bradley
 NAME
 27,536
 REGISTRATION NUMBER

AUTOMOBILE REGISTRATION AND INSPECTION SYSTEM**BACKGROUND OF THE INVENTION****1. Field of the Invention**

This invention relates in general to an improved object identification system, and in particular to an improved mobile object identification system. Still more particularly, the present invention relates to an improved apparatus and method for automatic identification and verification of vehicle compliance, such as the registration, inspection, and insurance status of automobiles.

2. Description of the Prior Art

To maintain safe public roadways, automobiles are required to comply with laws regarding vehicle registration, state inspection, and liability insurance requirements. Each automobile must be identified as to its current status of compliance with these laws. Present identification systems utilize adhesive decals that are affixed directly to the vehicles. Vehicle owners and operators are typically required to replace inspection and registration decals on their vehicles every year to keep them in compliance with the laws.

The decals are serialized, dated, and color-coded for ease of visual detection by mobile or stationary inspectors such as law enforcement personnel. When mobile inspectors are in transit, they have some difficulty reading and verifying the status of the decals and, thus, enforcing the laws requiring them. This lack of enforcement has allowed vehicle operators to abuse the inspection, registration, and insurance laws such that some vehicles are unsafe for roadway use. An improved method and apparatus for inspecting vehicle compliance with roadway safety laws is needed.

SUMMARY OF THE INVENTION

The present invention is directed to a method and apparatus for object identification, which includes an electronic mobile reader, base unit, an electronic vehicle transponder and electronic personal access tags. In one embodiment, the electronic mobile reader interrogates the electronic vehicle transponder with an RF (radio frequency) poll allowing the electronic vehicle transponder to backscatter an RF signal containing electronic personal access tag identification to the electronic mobile reader. The electronic mobile reader demodulates the signal and sends the electronic personal access identification to the base-unit where it identifies the status of the personal access tags that were inserted into the electronic vehicle transponder. The electronic personal access identification may be as simple as verifying the expiration data. No database search is necessary to evaluate the expiration data. The electronic personal access identification sent to the electronic mobile reader is compared to the current date for each electronic personal access tag stored in the electronic vehicle transponder memory. In one embodiment, either a red or green light illuminates indicating the noncompliance or compliance, respectively, of the electronic personal access identification of each electronic personal access tag received by the electronic mobile reader.

Each electronic personal access tag contains memory that is downloaded to the electronic vehicle transponder at the time the electronic personal access tag is inserted into the electronic vehicle transponder. An indicator will alert the user that the sequence has been completed successfully and, at that moment, the user will remove the electronic personal access tag from the electronic vehicle transponder. Electronic personal access tag memory will be rendered useless upon removal of electronic personal access tag from the electronic vehicle transponder if the data transfer was successful. In one embodiment, the electronic personal

access tag and the electronic vehicle transponder utilize an encryption scheme to eliminate fraud or misuse of the electronic personal access tag.

In another embodiment of the present invention, the electronic vehicle transponder utilizes an anti-theft/tamper proof scheme to render the transmitter circuitry useless if it is removed from the vehicle. An electronic personal access tag key is inserted into the electronic vehicle transponder to reactivate the transmitting circuits. The personnel electronic personal access tag key is be unique to that electronic vehicle transponder and can have an encryption scheme to eliminate fraud or theft. The electronic personal access tag key makes the electronic vehicle transponder virtually worthless to individuals that may want to remove them from vehicles.

The base-unit receives electronic personal access identification data from the electronic mobile reader and alerts the user to the status of the electronic vehicle transponder being interrogated. In one version, the base-unit utilizes green and red indicator lights to signify good and bad inspection, registration, insurance or any combination. In addition, the base-unit may be included in the electronic mobile reader.

The electronic vehicle transponder is an electronic device with on-board memory and, preferably, an encryption scheme. The electronic personal access tag is a contact smart card approximately half the size of a credit card. The smart card is inserted into a slot on the electronic vehicle transponder. The contacts on the smart card engage contacts inside the electronic vehicle transponder to provide power to the smart cards and start a flashing green indicator on the electronic vehicle transponder. When the data is transferred from the smart card memory to the electronic vehicle transponder memory, a solid indicator illuminates acknowledging the status of the data transfer. The electronic vehicle transponder will not start

transmitting the information until the electronic personal access tag is removed from the slot.

The foregoing and other objects and advantages of the present invention will be apparent to those skilled in the art, in view of the following detailed description of the preferred embodiment of the present invention, taken in conjunction with the appended claims and the accompanying drawings.

5

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

BRIEF DESCRIPTION OF THE DRAWINGS

So that the manner in which the features, advantages and objects of the invention, as well as others which will become apparent, are attained and can be understood in more detail, more particular description of the invention briefly summarized above may be had by reference to the embodiment thereof which is illustrated in the appended drawings, which drawings form a part of this specification. It is to be noted, however, that the drawings illustrate only a preferred embodiment of the invention and is therefore not to be considered limiting of its scope as the invention may admit to other equally effective embodiments.

Figure 1 is a perspective view of a presenting unit with two programmable cards inserted therein and is constructed in accordance with one embodiment of the present invention;

Figure 2 is a front elevational view of the presenting unit and programmable cards of **Figure 1**;

Figure 3 is a side view of the presenting unit and programmable cards of **Figure 1**;

Figure 4 is a front elevational view of one of the programmable cards of **Figure 1**;

Figure 5 is a perspective view of a detector of the present invention;

Figure 6 is a front elevational view of the detector of **Figure 5**;

Figure 7 is a side view of the detector of **Figure 5**;

6

Figure 8 is a schematic diagram illustrating an embodiment of the present invention installed in an automobile and a law enforcement vehicle;

Figure 9 is a block diagram of the presenting unit of **Figure 1**; and

5

Figure 10 is a block diagram illustrating a preferred embodiment of the entire system of the present invention and the relationship between its major components.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to **Figures 1-7**, an automobile registration and inspection system comprises a presenting unit **10**, a detector **12**, and programmable information cards **14**. As shown in **Figure 1**, the presenting unit **10** is a device of nominal thickness and dimensions with a front side **16** and back side **18**. Slots **20** on the top of the presenting unit **10** allow the insertion of programable information cards **14**. The slots **20** are aligned horizontally but they may be stacked one behind the other allowing the presenting unit **10** to be narrower in width. The presenting unit **10** secures to an automobile windshield or other structure in a way that prevents removal and tampering by someone other than the owner of the automobile. In one version, the presenting unit **10** accepts a vehicle registration card **22** and a vehicle inspection card **24**, as shown in **Figure 2**. However, the presenting unit **10** could also be used with other cards **14** containing information such as vehicle insurance, etc.

The detector **12** of the present system is a device located a distance away from the presenting unit **10**, preferably in a law enforcement vehicle **60**, as shown in **Figure 8**. Detector **12** in law enforcement vehicle **60** is used to monitor and inspect the cards **14** in presenting unit **10**, which may be mounted in, for example, a passenger vehicle **62**. Referring to **Figures 5-7**, the detector has a front panel **26** containing indicators **28**. Indicators **28** may be in the form of light-emitting elements (e.g., light-emitting diodes or laser diodes) to show a "good" (in compliance) or "bad" (noncompliance) signal has been processed for each type of interrogation (e.g., registration, inspection, etc.), as shown in **Figure 6**. Alternatively, a textual indicator or other sensory means may be used as well. An audible selector **30** allows the operator to choose whether one receives an audible signal in addition too or instead of the indication given on the front panel **26**. The detector **12** reads the signal emitted by the presenting unit **10** and provides a

comprehensible indication to the operator of the detector 12. Many types of signals may be used by the presenting unit 10 and detector 12 such as infrared signals, radio frequencies (RF), radar technology, satellite tracking, cellular or digital signals, and/or microwave frequencies. The projection selector 32 on the detector 12 allows acceptance of signals from the front or back or both sides of detector 12. In one version, the system functions at a minimum range of about 60 feet.

Referring now to **Figure 9**, there is depicted an embodiment of a presenting unit 10. Presenting unit 10 includes a registration card reader 34a and an inspection card reader 34b that are utilized to extract the information stored on vehicle registration card 22 and vehicle inspection card 24 (see **Figures 1-2**). It should be apparent to those skilled in the art that the type of registration and inspection card readers 34a, 34b utilized are dependent on the encoding methodology employed in writing data onto the vehicle registration and inspection cards 22, 24. Thus, if the vehicle's information are encoded on a magnetic strip, for example, registration and inspection card readers 34a, 34b are conventional magnetic card readers. The present invention does not contemplate limiting its practice to any one particular encoding scheme. For example, in another advantageous embodiment, the data may be encoded using bar codes and, consequently, registration and inspection card readers 34a, 34b are conventional optical bar code readers.

To prevent the use of vehicle registration and inspection cards 22, 24 on other vehicles for which they are not authorized, registration and inspection card readers 34a, 34b, may, after the cards are inserted into presenting unit 10 for the first time, erase the information on the cards, thus invalidating and precluding the use of the cards with any other automobile. Alternatively, in another embodiment, registration and

inspection card readers **34a**, **34b** may add an additional piece of information on the cards to indicate that the cards have been associated with a particular automobile. Still other security measures also may be employed to prevent misuse of the system.

5 Again referring to **Figure 9**, a controller **36**, such as conventional microprocessor, is coupled to registration and inspection card readers **34a**, **34b** and to an RF transponder **38**. Controller **36**, in an advantageous embodiment, utilizes its internal clock to time-stamp the first insertion of vehicle registration and inspection cards **22**, **24** into presenting unit **10**.
10 Generally, the information contained on vehicle registration and inspection cards **22**, **24** and the time stamp are saved in a registry file within the memory of controller **36**. This allows controller **36** to periodically check the recorded time-stamp, at predetermined intervals, to determine if the cards have "timed out," i.e., expired, e.g., after one year.

15 RF transponder **38** is a conventional transponder that is tuned to transmit only at two predetermined frequencies corresponding to the "good" and "bad" signals discussed previously. Controller **36** selectively switches RF transponder **38** to emit the good or bad signal based on information
20 retrieved by registration and inspection card readers **34a**, **34b** as described above. The good or bad signal is transmitted by presenting unit **10** utilizing an antenna **40** coupled to RF transponder **38** that, in a preferred embodiment, is a directional antenna. Alternatively, in another
25 advantageous embodiment, antenna **10** may include both an omnidirectional (isotropic) antenna, such as a whip antenna, and a directional antenna, such as a Yagi or micro strip patch. Also shown in the illustrated embodiment, is a power supply **42**, such as battery or an adapter to the automobile's battery, that provides power to registration and inspection card readers **34a**, **34b**, controller **36** and RF transponder **38**.

In operation, a law enforcement official in a law enforcement vehicle 60 (Figure 8) positions the audible selector 30 and projection selector 32 of detector 10 in desired positions. As an automobile 62 with a presenting unit 10 in place comes into range of the detector 12, the detector 12 analyzes the emitted signal and produce a reading on the front panel 26. In another version of the present invention, the detector 12 may be incorporated into a police radar detector gun.

A block diagram of a further embodiment of the present invention illustrating the relationship between the major components of the system is shown in Figure 10. The electronic personal access tag 200 allows the vehicle owner and/or an associated organization to download data into the electronic vehicle transponder 300 (an alternate version of presenting unit 10). The electronic personal access tag 200 is a contact smart card 530 (an alternate version of one of the cards 14) with limited memory 210. The memory 210 contains, for example, information that identifies the vehicle owner, the type of registration tag, and expiration date(s). The information identifying the vehicle owner may be but is not limited to the license plate number of the vehicle. Vehicle transponder 300 verifies that the correct electronic personal access tag 200 is being used with an authorized electronic vehicle transponder 300, allowing the electronic personal access tag 200 to download data. If the vehicle owner's identification does not match, the download process will not take place (a proper match may be determined, for example, with reference to the vehicle's unique vehicle identification number). In addition, an indicator light illuminates on the electronic vehicle transponder 300 as to the status of the download. After memory 210 of personal access tag 200 successfully downloads its contents, vehicle transponder 300 initiates a process to render electronic personal access tag memory 210 useless. This will effectively prevent unauthorized use of personal access tag 200. The transaction between the

electronic mobile readers and the electronic personnel access tag will be protected by an encryption scheme 220 to prevent fraud and/or misuse.

Expiration date and tag type identifies the particular organization to which the electronic personal access tag 200 was issued, and the date on which the personal access tag 200 expires. In one version of the present invention, each organization that issues registrations and inspections, and/or private insurance company is capable of issuing electronic personal access tags 200 to authorized users.

Referring again to Figure 10, the electronic vehicle transponder 300 is a self-contained unit comprising an RF-detector, RF-demodulator 330, microcontroller 320 with non-volatile memory 310, and antenna 350. It uses wireless backscatter modulation 340 technology to respond to RF signals transmitted from the 915 MHz antenna 350 assembly by reflecting and modulating the received RF signal. In one version, the downlink 520 interrogation from the electronic mobile reader 100 (an alternate version of detector 12) operates at 915MHz, horizontally polarized, modulation 140 method amplitude shift keying, and the modulation 140 pattern is continuous wave.

The electronic vehicle transponder 300 detects the 915 MHz field and demodulates the signal. If the modulation 340 is correct, the transponder starts to backscatter modulate. The backscatter modulation 340 radar cross-sectional area is, in one version, a minimum of 50 square centimeters, backscatter encoding subcarrier type, subcarrier frequency 500 kHz, subcarrier modulation 340 two phase shift keying, subcarrier data encoding is differential, and subcarrier data speed is 125 bits per second. The data sent to the mobile reader contains, for example, the vehicle owner's identification, expiration date, and tag type.

5 The electronic mobile reader **100** is a two-watt amplitude shift keyed transmitter **110** homodyne receiver operating in the 909.75 to 921.75 MHz band. In the downlink **520** mode, filtered Manchester-coded data shifts the transmitter between two power levels differing by more than 25 dB at a 300 kbps signaling rate. In the uplink **510** mode, the electronic reader transmits an unmodulated carrier at approximately 916 MHz, and the electronic vehicle transponder **300** amplitude modulates the reflected signal with one of two frequencies, 600 kHz or 1200 kHz, to encode the uplink **510** binary data. The electronic mobile reader's **100** homodyne receiver down converts **160** the 600 kHz or 1200 kHz modulation **140** tones to base band filters and removes amplitude variation from the frequency shift-keying signal. The transceiver homodyne transmitter transmits two different types of signals, amplitude modulated downlink **520** signal to send data to the electronic vehicle transponder **300** and an unmodulated carrier to illuminate the tag for the backscatter modulation **340** uplink **510** mode.

10 The electronic mobile reader **100** can multiplex two transmitter and receiver channels. These channels are connected to two antenna pairs **150** that allow the mobile user to read forward and aft electronic vehicle transponder **300**. The electronic mobile antenna **150** allows for a directional read zone to accommodate highway and rural speed requirement. The power of the mobile reader can be adjusted to control read zone distances. Yagi, dipole and patch array antennas **150** are utilized to accomplish the wide variety of read zone requirements.

20 The electronic mobile reader **100** compares the data received from the electronic vehicle transponder **300** and performs a simple microprocessor **130** and memory **120** comparison of the expiration date for each electronic personal access tag **200** type to the present date. This comparison activities an algorithm for each tag type and sends a digital

signal 500 to the base-unit 400 to illuminate the correct user indicator 410.

5 The automobile registration and inspection system provides several advantages. The invention is adaptable to be used in application not only with automobiles but also marine craft, water craft, air craft or
10 motorcycles. Likewise, the practicability and ease of operation of programmable information cards permit the distribution by a licenced agency and installation by the public. Also, the detector does not require the use of a database to compare and analyze the received signal. The system may be completely independent of any on-board computers in the vehicles.

15 While the invention has been shown or described in only some of its forms, it should be apparent to those skilled in the art that it is not so limited, but is susceptible to various changes without departing from the scope of the invention.

What is claimed is:

1. A system for monitoring regulatory compliance of a vehicle, comprising:

vehicle transponder means for transmitting vehicle compliance data;

mobile detector means for sending an interrogation signal to said

vehicle transponder means, and for receiving said vehicle compliance data; and

means for determining a compliance status based on the vehicle compliance data.

2. The system of Claim 1 wherein the vehicle compliance data is stored locally at said vehicle transponder means.

3. The system of Claim 1 wherein said vehicle transponder means transmits vehicle compliance data which includes an expiration date and tag type associated with a vehicle regulation.

4. The system of Claim 1 wherein said vehicle transponder means includes a removable, memory-bearing media containing the vehicle compliance data.

5. The system of Claim 1 wherein said vehicle transponder is interrogated by said mobile detector means using signals selected from the group consisting of infrared signals, radio frequency signals, radar signals, satellite tracking signals, digital signals, cellular signals, and microwave signals.

6. The system of Claim 1 wherein said mobile detector means includes first and second antennas for forward and aft vehicle interrogation, respectively.

7. The system of Claim 4 wherein said memory-bearing media comprises a smart card.

8. The system of Claim 4 wherein said memory-bearing media contains the vehicle compliance data in the form of an expiration date and a tag type for a plurality of vehicle regulations.

9. The system of Claim 4 wherein said vehicle transponder means includes means for reading the vehicle compliance data from said memory-bearing media.

10. The system of Claim 3 wherein said determining means compares the expiration date to a current date.

11. The system of Claim 1 wherein said vehicle transponder means includes means for invalidating said memory-bearing means after said vehicle transponder means has downloaded the vehicle compliance data therefrom.

12. The system of Claim 1 wherein said vehicle compliance data comprises a signal whose frequency is indicative of the compliance status.

16

13. An electronic automobile inspection system comprising:
at least one smart card containing information pertaining to
compliance of an automobile with a vehicle regulation;
a transponder having a memory;
a card reader adapted to receive the information on said smart card
and download the information to said memory of said transponder; and
a detector having means for remotely interrogating said transponder,
said transponder providing a signal to the detector in response to said
interrogation, the signal being indicative of a compliance status of the
automobile.

10

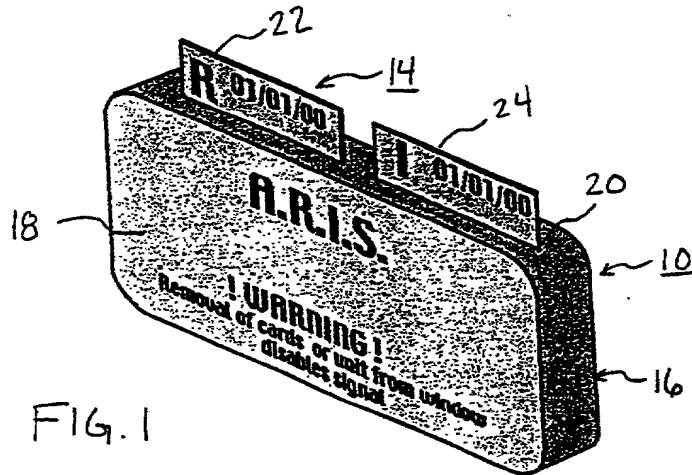


FIG. 1

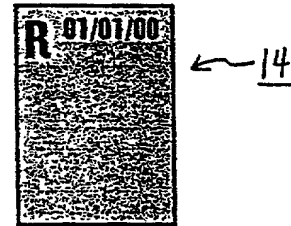


FIG. 4

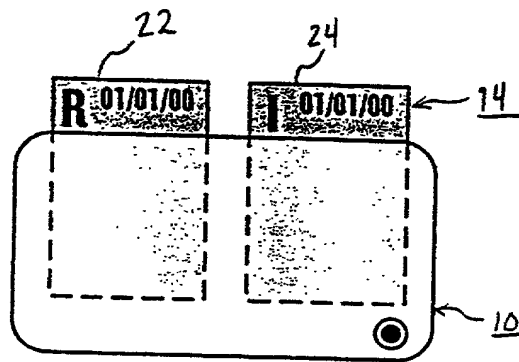


FIG. 2

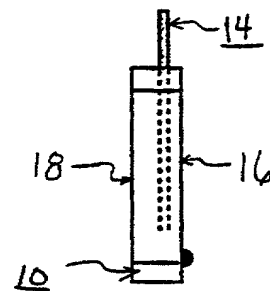
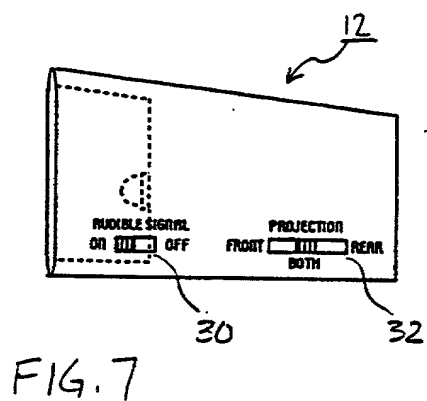
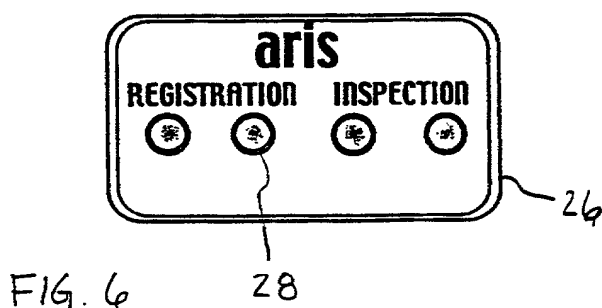
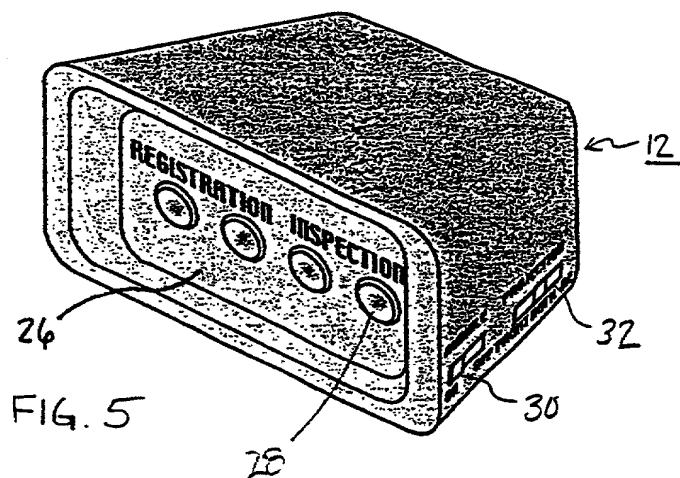


FIG. 3



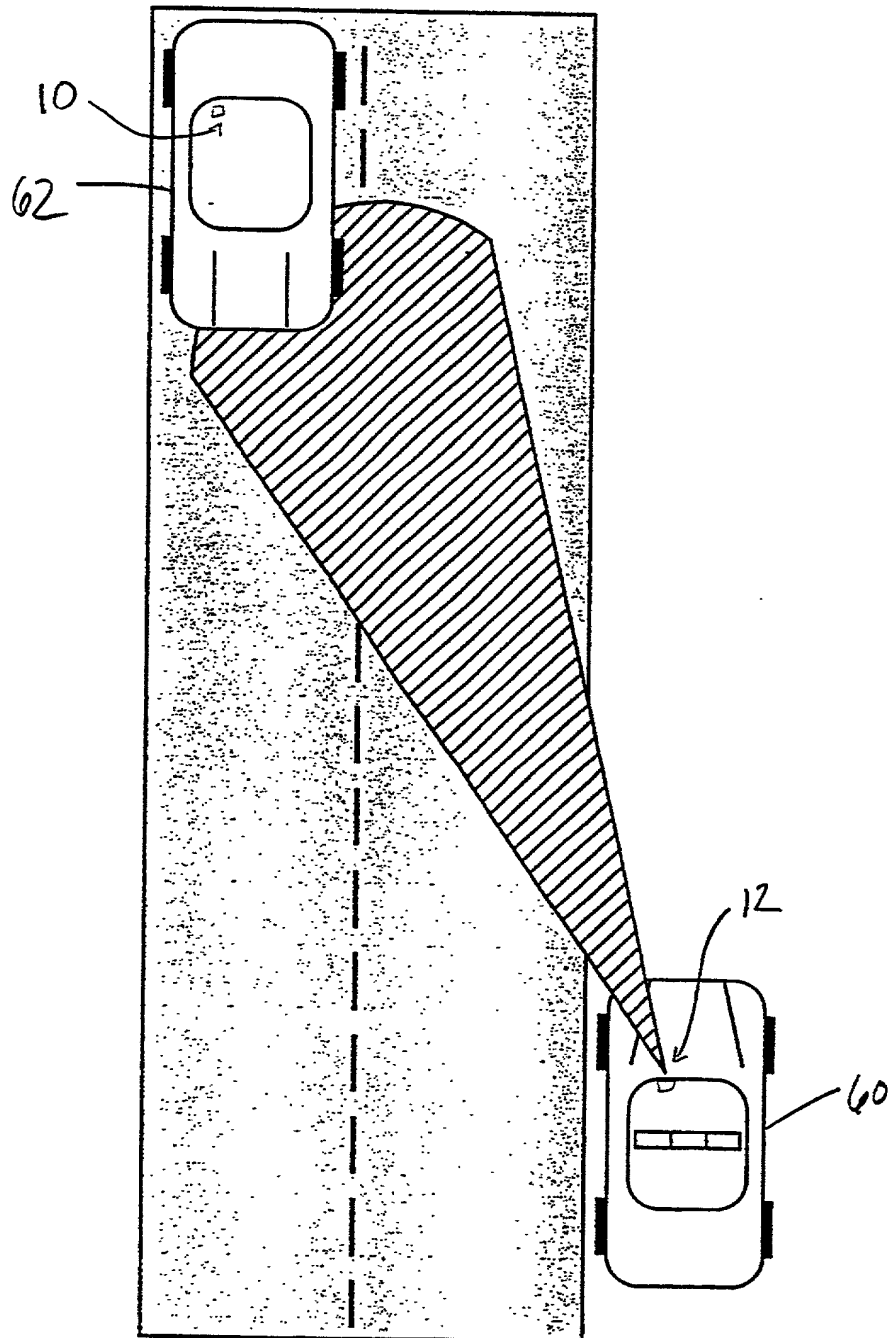


FIG. 8

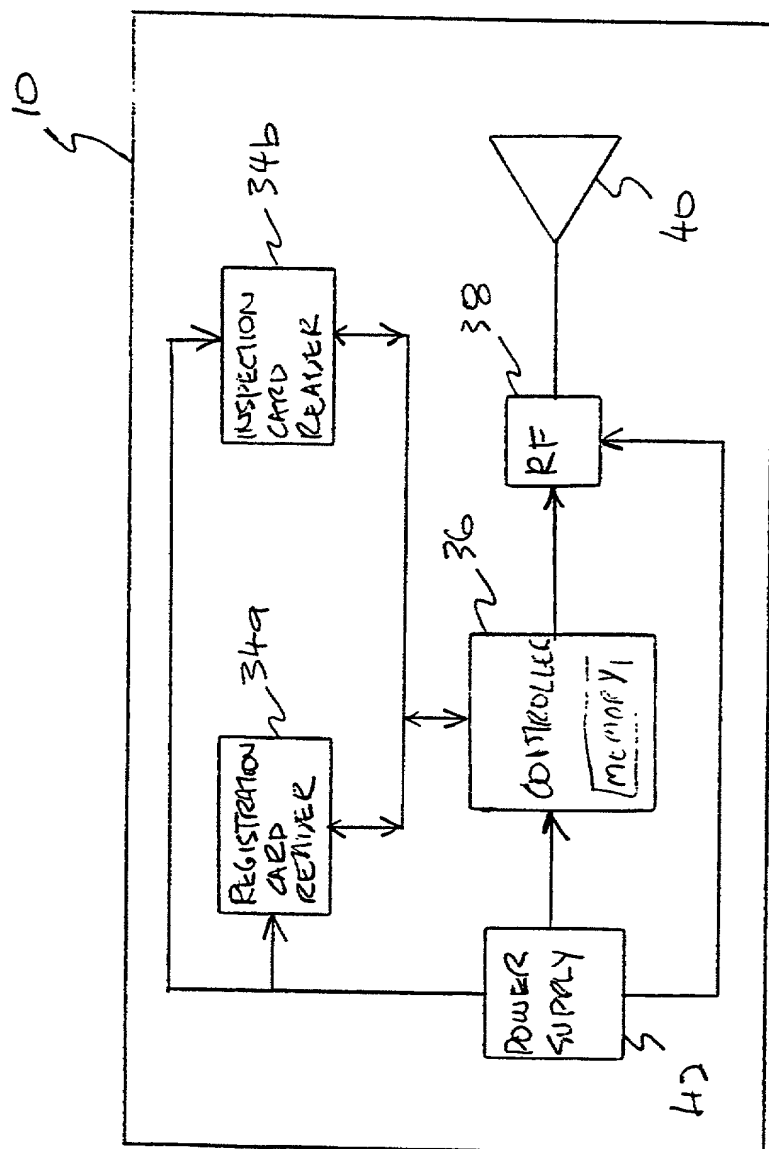


FIG. 9

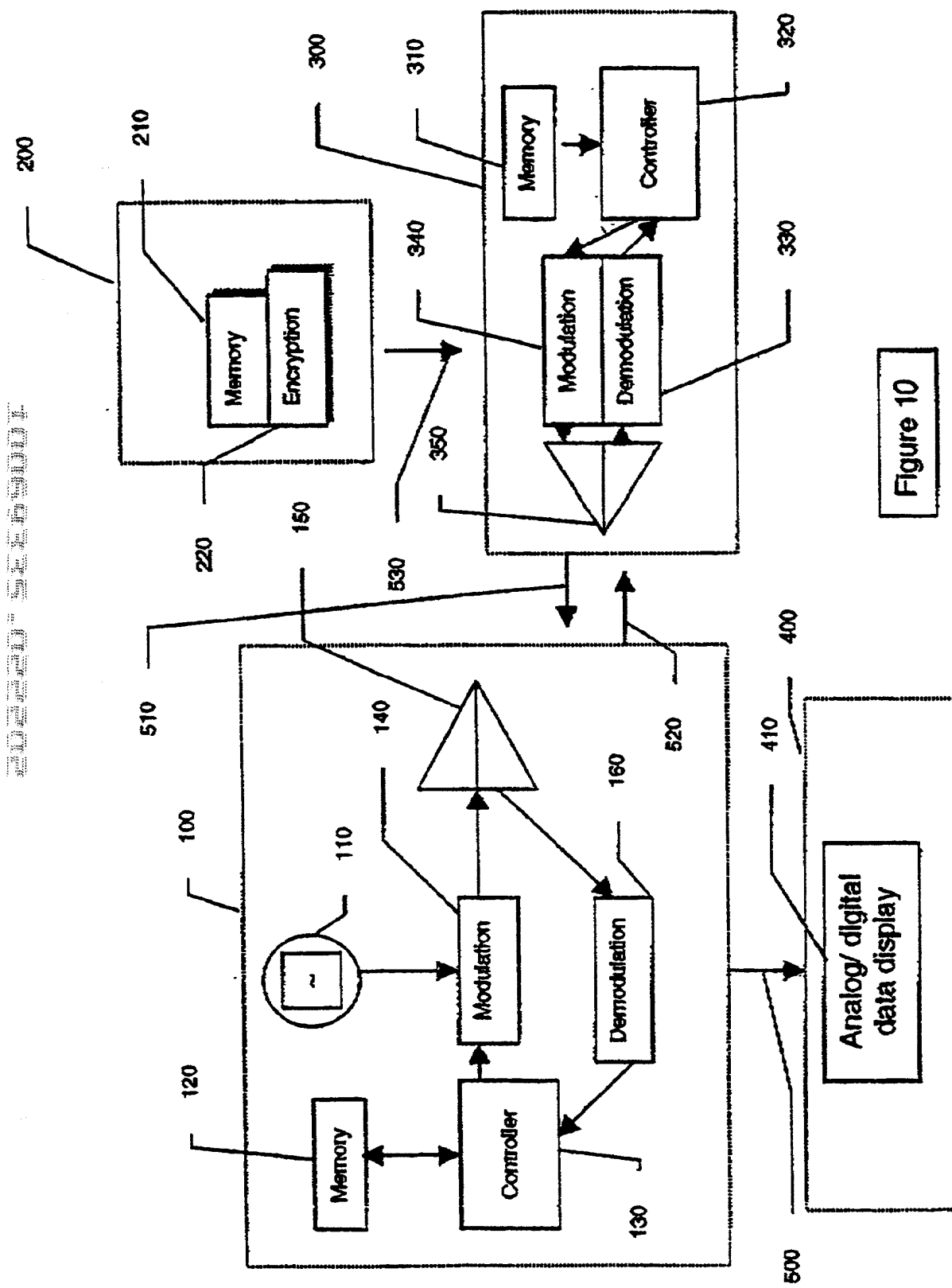


Figure 10

FROM :

FAX NO. : 5973811

Oct. 05 2000 02:24PM P4

DECLARATION FOR PATENT APPLICATION

DOCKET 2031JB-45073

As the below named inventor, we hereby declare that:

Our residence, post office address and citizenship are as stated below our names.

We believe that we are the original, first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled:

AUTOMOBILE REGISTRATION AND INSPECTION SYSTEM

filed on August 24, 2000, as Serial Number PCT/US00/40731.

We hereby claim the benefit under Title 35, United States Code, §119(e) of any United States application(s) listed below:

NUMBER	DATE FILED
--------	------------

We hereby state that we have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

We acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Sec. 1.56(a).

We hereby claim foreign priority benefits under Title 35, United States Code, Sec. 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

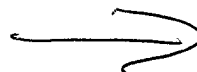
PRIOR FOREIGN APPLICATION(S)

NUMBER	COUNTRY	DATE FILED	PRIORITY CLAIMED
			YES NO

We hereby claim the benefit under Title 35, United States Code, Sec. 120 of any United States application listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in any prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Sec. 1.56(a), which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

SERIAL NO.	FILING DATE	STATUS
PCT/US00/40731	24 AUGUST 2000	Pending

1



We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Sec. 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the publication or any patent issued thereon.

1-00
FIRST INVENTOR'S NAME: JOHN D. KONDROIK JR
SIGNATURE: [Signature]
DATE: 10-12-00
RESIDENCE: #5 Windsor Court, Lufkin, Texas 75901
COUNTRY OF CITIZENSHIP: USA
POST OFFICE ADDRESS: SAME TX

2-00
SECOND INVENTOR'S NAME: JIM DON SMITH
SIGNATURE: [Signature]
DATE: 10-12-00
RESIDENCE: 104 Forest Creek, Lufkin, Texas 75901
COUNTRY OF CITIZENSHIP: USA
POST OFFICE ADDRESS: SAME TX

3-00
THIRD INVENTOR'S NAME: DONALD J. BERGERON
SIGNATURE: [Signature]
DATE: OCT 10, 2000
RESIDENCE: 1017 East Seminole Trail, Carrollton, Texas 75007
COUNTRY OF CITIZENSHIP: USA
POST OFFICE ADDRESS: SAME TX

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:
JOHN D. KONDROIK, JR.
JIM DON SMITH
DONALD J. BERGERON

SERIAL NO.: Unknown

FILED: Herewith

TITLE: AUTOMOBILE REGISTRATION
AND INSPECTION SYSTEM

§ DOCKET NO.:
§
§
§
§ GROUP ART NO.:
§ Unknown
§
§
§ EXAMINER:
§ Unknown
§

POWER OF ATTORNEY

The Honorable Commissioner
of Patents & Trademarks
Washington, D.C. 20231

Sir:

The undersigned, being Assignee of the entire interest of the above-identified patent application by virtue of an assignment filed for recording in the U.S. Patent and Trademark Office on even date herewith, hereby elects, under (37 CFR §3.71), to prosecute this application to the exclusion of the inventor(s).

The Assignee hereby appoints:

James E. Bradley, Reg. No. 27,536;
Frank S. Vaden III, Reg. No. 22,236;
Kent A. Rowald, Reg. No. 34,005; and
Tim Cook, Reg. No. 40,853

(4)


jointly and severally, as its attorney or agent, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to transact all business in the Patent and Trademark Office in connection therewith and to receive the Letters Patent. All previous powers, if any, are hereby revoked.

Please direct all communications to:

James E. Bradley
BRACEWELL & PATTERSON, L.L.P.
711 Louisiana Street, Suite 2900
Houston, Texas 77002-2781
(713) 223-2900

ASSIGNEE: DETECTION DEVICE SYSTEMS, LLC

BY:


Name: JIM DON SMITH
Title: PRESIDENT

Date: February 16, 2001